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Version: Version of Record

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<http://dx.doi.org/doi:10.21954/ou.ro.0000e189>

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UNRESTRICTED
**OXFORD REGIONAL TRAINING COURSE IN CLINICAL
PSYCHOLOGY**

**Concerns about Weight and Shape in Overweight 12 year old Girls and their
Mothers**

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**A thesis submitted in partial fulfilment of the requirements of the Open University
Doctorate in Clinical Psychology**

British Psychological Society

September 1998

Estimated word count: 25,000

DATE OF AWARD: 15 SEPTEMBER 1998

ABSTRACT

Concerns about weight, shape and eating and attempts at dietary restraint are prevalent among young girls, but may increase of the risk of the development of eating disorders, especially if low self-esteem or symptoms of depression are also present. The literature suggests that there may be links between mothers and daughters attitudes towards weight, shape and dietary restraint. The aim of the study was to investigate whether concerns about weight, shape and eating and attempts at dietary restraint differed between overweight and average-weight girls; and whether overweight girls had lower self-esteem, and/or more symptoms of depression than average-weight girls. Possible links between mothers' and daughters' attitudes towards weight and shape and dietary restraint were also investigated. Results showed that overweight girls had more concerns about weight, shape and eating and attempted dietary restraint more than average weight girls. Overweight girls had more negative perception of their athletic competence, physical appearance and global self-worth, and more symptoms of depression than average-weight girls. Mothers of overweight girls, who themselves had higher BMIs than the mothers of average-weight girls, had more concerns and negative beliefs about weight, shape and eating and attempted more dietary restraint, than the mothers of average-weight girls. Although there was some association between mothers' and daughters' concerns in the average-weight group these associations were not present in the overweight group. The conclusions were that overweight girls may be particularly vulnerable to the development of eating disorders, but that the links between mothers' and daughters' concerns are not straightforward.

ACKNOWLEDGEMENTS

Firstly I would like to thank everyone who took part in the study for their patience and co-operation and the schools for their assistance with recruitment.

My sincere thanks to Myra Cooper for her supportive supervision throughout the project and in particular during writing up of the study; and to Paul Griffiths for his patience in providing statistical advice.

My thanks also to Rachel Bryant-Waugh and Beth Watkins for the training me with the CH-EDE and to Ian Frampton for his assistance in scoring.

Finally, I would like to thank all my family, friends and in particular my fellow trainees for their friendship, support and understanding throughout.

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1. INTRODUCTION

In the first section of the introduction a brief overview of obesity will be presented, and some of the issues associated with obesity in childhood will be outlined. The second section will consider how being overweight as a child may be a risk factor for the development of eating disorders. Evidence for the development of over-valued attitudes to weight and shape and dieting behaviour in young girls will be discussed. It will be argued that girls who are overweight are particularly at risk of developing negative attitudes towards their weight and shape and of attempting dietary restraint. The emotional sequelae of childhood obesity will be considered as a further risk factor.

The third section will examine the evidence for links between mothers' and daughters' concern about weight and shape and dietary restraint. It will be argued that mothers may be more influential in the development of their daughters' attitudes and eating related behaviour, than fathers. Where mothers have over-valued attitudes about weight and shape and model dieting behaviour to their daughters this may increase the vulnerability of girls to the development of eating disorders, particularly in girls who are overweight.

Finally, the rationale for the project will be put into a theoretical context drawing on cognitive-behavioural, systemic and social learning theories. The research questions and hypotheses will then be outlined.

1.1 Overview of obesity

1.11 Obesity in Adults

Obesity has increased in prevalence in recent decades and 16% of women and 12% of men in Britain are now classified as obese (Prescott-Clarke & Primatesta, 1998).

Obesity has been described as ‘one of the most difficult medical and psychological problems of modern society’ (Brownell, 1982, p. 820). One of the Health of the Nation targets is to reduce obesity to 7% or less by the year 2005 (Department of Health, 1991).

The biopsychosocial nature of obesity is now generally accepted (Maloney & Klykylo, 1983). Whilst body shape and weight are to some extent determined by genetic factors (e.g. Stunkard, Foch & Hrubec, 1986; Stunkard, Sorensen, Hanis, Teasdale, Chakraborty, Schull & Schulsinger, 1986) the role of environmental factors is also important, even in those with a genetic predisposition to obesity (Price, Stunkard, Ness, Wadden, Heshka, Kanders & Cormillot, 1990). Activity levels, diet and family environment have all been identified as contributing to obesity. Price et al. (1990) suggest that there may be several different forms of obesity with different aetiologies, some primarily genetic, others more heavily influenced by psychosocial or environmental factors.

1.12 Obesity in childhood

Defining obesity in children

Unlike in adults where the definition of obesity is generally accepted as a Body Mass Index [BMI = weight (kg)/height (m²)] of 30 or above (Livingstone & Bray, 1989), there is no clear definition of obesity in children. With children there are a number of conceptual difficulties in defining obesity primarily because of differences between the body composition of children and adults. BMI changes substantially with age, rising steeply in infancy, falling during pre-school years and then rising again during adolescence (Cole, Freeman & Preece, 1995). Common practice is to classify a child as obese when their weight-for-height is 120% or more of ideal weight for height, age and sex (Krasnegor, Grave & Kretchmer, 1988) or at or above the 97th centile on age related reference curves (Cole et al., 1995).

Prevalence

As with adults the prevalence of obesity in children has increased in recent decades (Epstein, 1993). Estimates of the prevalence of obesity in childhood vary widely due to a number of methodological factors such as differences in criteria used for defining obesity, the country of origin of the data and the social class, race, gender and age of the sample. Maloney and Klykylo (1983) maintain that approximately 10% of school-age children and 15% of adolescents in the USA are obese, whilst Epstein (1993) estimates that the figure may be as high as 27% of 6-11 year olds and 22% of 12-18 year olds. A national survey of health and development carried out in the UK (Stark, Atkins, Wolff & Douglas, 1981) found that at every age proportionately more girls than

boys were obese and that prevalence increased from approximately 2.5% at 6 years of age to approximately 9% by 11 years. A more recent survey (Prescott-Clarke & Primatesta, 1998) estimates that overall 4% of school aged children in the UK are now obese.

The prevalence of obesity has been found to be higher among children of obese parents (Epstein, 1993). However, there is a curvilinear relationship with the age of the child, the greatest association occurring in early adolescence and declining into adulthood (Garn, Sullivan & Hawthorne, 1989).

Problems associated with childhood obesity

Childhood obesity is one of the most complex and least understood disorders in paediatric psychology (Hopman, 1991). It is typically a long-term, treatment resistant problem which carries the risk of medical and psychological complications (Banis, Varni, Wallander, Korsch, Jay, Adler, Garcia-Temple, & Negrete, 1988). One of the worrying features of childhood obesity is its persistence (Brownell, 1982).

There are a number of health risks associated with the condition, including decreased hormone release, hypertension, carbohydrate intolerance and diabetes; it has also been suggested that obesity in childhood makes an independent contribution to risk of coronary heart disease in later life (Brownell, 1982). Furthermore, approximately 80% of obese children become obese adults (Maloney & Klykylo, 1983) for which the health risks are well established (Stunkard & Wadden, 1993).

In addition to physical health problems, there can be serious psychological and social consequences of obesity in children (Brownell, 1982). It has been suggested that in childhood psychosocial factors may play a key role in the maintenance of the problem (Christoffel & Forsyth 1989). Several authors have noted the social stigma associated with obesity (Kinston, Loader & Miller, 1987). For example, children as young as six years old rate obese children as less likeable than children with physical handicaps (Maddox, Back & Liederman, 1968) and describe silhouettes of overweight children as 'lazy, dirty, stupid, ugly, cheats and lies (*sic*)' (Staffieri, 1967; cited by Wadden & Stunkard, 1993, p.163).

Eating habits and energy expenditure

A large body of research has examined the role of food consumption, energy expenditure and metabolic rate in obese children. However, this remains a controversial area and there is a continuing debate about whether or not overweight or obese children differ from normal-weight peers in their eating habits, levels of physical activity or metabolic rate (Epstein, 1993). From her review of the literature Hopman (1991) concluded that the contradictory findings are largely due to methodological problems. For example, failure to control for palatability or energy expenditure in relation to the amount of food consumed, reliance on parental reports of eating habits, or observer bias in rating the quantity or speed of eating, can all confound results.

Ballard, Gipson, Guttenberg & Ramsey (1980) reported that when palatable food consumption was compared, normal-weight children left twice as much on their plates

as obese children. In her study of 8-11 year olds, Hopman (1991) found that mothers reported that normal weight children ate more regular meals than their obese peers. Obese children were also reported by their mothers to be likely to eat more when under stress than normal-weight children. Dietz & Gortmaker (1985) maintain that obese children watch more television than their normal weight peers and that there is a positive association between amount of time spent watching television and the degree of obesity. This finding implies that obese children have a more sedentary lifestyle than their normal weight peers.

It seems likely that there are indeed differences in the amount or type of food consumed and/or that there are differences in energy expenditure between obese and normal weight children (Epstein, 1993). This study concerns the psychological consequences of childhood obesity, particularly those factors which might put a child at risk of developing an eating disorder as a consequence of becoming overly concerned about their weight or shape and subsequently attempting dietary restraint.

1.2 Obesity as a risk factor for the development of disordered eating

Whilst obesity in children is not classified as an eating disorder in DSM-IV (American Psychiatric Association, 1994), it is one of the risk factors for the later development of both bulimia nervosa (Striegel-Moore, Silberstein & Rodin, 1986) and binge eating disorder (Fairburn, 1995). Being overweight as a child is also associated with the development of anorexia nervosa, though to a lesser extent than bulimia nervosa (Garfinkel & Garner, 1982).

The risk of developing disordered eating as a result of being overweight in childhood may be due to the development of concern about weight and shape and a tendency towards attempting dietary restraint, although to date, no known study has systematically investigated this possibility. Low self-esteem and depression, which have also been associated with obesity in girls, (Banis et al., 1988; Strauss, Smith, Frame & Forehand, 1985) have also been identified as possible risk factors for the development of eating disorders (e.g. Fairburn, 1995). Taken together, this suggests that girls who are overweight may be particularly vulnerable to the development of an eating disorder. The following sections will expand this hypothesis.

1.21 Attitudes towards weight and shape

Undue influence of weight or shape on self-evaluation is a defining feature of anorexia nervosa, bulimia nervosa and binge eating disorder (American Psychiatric Association, 1994).

There is evidence that concerns about weight and shape can pre-date adolescence. Hill, Oliver & Rogers (1992) noted that some girls as young as nine years old are discontented with their body image. P. Cooper & Goodyer (1997) found that more than one in ten 11 year old girls were concerned about their weight or shape and that this prevalence rate increased with age to almost one in five of 15-16 year olds.

Among the older adolescents concern about weight or shape was associated with disturbance in eating habits in a significant minority of girls. In girls who are

objectively overweight this concern is likely to be particularly prominent due to increased self-consciousness, and the social stigma associated with obesity (Kinston et al., 1987). However, to date, no known study has specifically investigated this.

1.22 Dietary Restraint

Dieting, another key feature of eating disorders (Garner & Bemis, 1982; Fairburn, Z. Cooper & P. Cooper, 1986), has reached epidemic proportions in all female age groups (Waterhouse, 1997). One recent survey (Allaz, Bernstein, Rouget, Archinard & Morabia, 1998) found that 71% of women wanted to be thinner (even though 73% of them were within normal weight range) and that 42% of them had dieted within the last five years.

Not only is the proportion of women dieting increasing, but the age at which girls begin to be concerned about their weight and shape is getting lower (Wardle & Marsland, 1990). Hill, et al. (1992) reported that some children as young as nine years old attempted to restrain their eating.

By early adolescence, girls demonstrate considerable motivation to diet and those who do are more likely to overeat when their diet is broken (Hill, Rogers & Blundell, 1989). Restraint and intention to diet tends to be higher in girls than boys and can be predicted from beliefs about the positive outcome of dieting and conditions which facilitate dieting, such as family and peer support (Conner, Martin, Silverdale & Grogan, 1996). Conner, et al. (1996) also found that girls were more likely than boys to perceive

conditions as facilitating dieting, suggesting that it might be more acceptable for girls than boys to diet.

However, Huon, Godden and Brown (1997) queried the reliability of reports of high levels of dieting in pre-adolescent children. They suggest that the self-report questionnaires such as the Dutch Eating Behaviour Questionnaire (DEBQ; Van Strien, Frijters, Bergers & Defares, 1986), used by Hill et al. (1992) are biased towards disordered eating and that children are particularly susceptible to responding to leading questions in what they perceive to be the desired way. These authors therefore recommend caution in interpreting the results of questionnaire surveys of children's dieting. Moreover, the DEBQ was developed specifically for use with adults.

Further support for this caution comes from French, Peterson, Story, Anderson Mussell & Mitchell (1998). They found that adolescents reported significantly more disturbed eating patterns, episodes of self-induced vomiting, laxative misuse and fasting through questionnaire assessment than when interviewed, using a sub-set of the Eating Disorders Examination (EDE; Fairburn & Z. Cooper, 1993). These authors query whether this discrepancy is due to over reporting on the self-report measure or reluctance to disclose such habits to interviewers.

Nevertheless, there is growing concern that dieting creates unhealthy food relationships. Polivy and Herman (1985) argue that chronic dieting requires the dieter to ignore signals of hunger and satiety, which undermines the capacity to perceive these cues accurately and the ability to use them to control eating.

As with concerns about weight and shape, dietary restraint is likely to be particularly prevalent amongst girls who are objectively overweight. However, dieting can be counter-productive (Gilbert, 1989). Wilson (1994) suggests that 90-95% of obese adults who lose weight will return to their baseline weight within five years. Hill et al. (1989) found a significant positive correlation between BMI and degree of restraint in adolescents, which, they argue, may reflect the inability of most dieters to successfully control their weight through restraint. Moreover, dieting usually precedes the onset of an eating disorder (Polivy & Herman, 1985) and can play a key role in initiating and maintaining binge eating problems (Fairburn, 1995), which in turn can lead to episodes of bulimia nervosa or to obesity (Pirke & Laessle, 1993).

1.23 Emotional sequelae of overweight

Low self-esteem and depression, both of which are features of anorexia nervosa (Garner & Bemis, 1982) and bulimia nervosa (Fairburn, Z Cooper & P. Cooper, 1986) are also among the possible emotional sequelae of obesity in childhood (e.g. Banis et al., 1988; Strauss et al., 1985) .

There are at least two possible explanations for an association between obesity and psychological distress. Firstly, obesity can be viewed as occurring as a result of overeating in response to negative feelings, or inability to establish satisfactory relationships (e.g. Becker, 1960). Support for the view that such problems can contribute to the development of obesity comes from a study by Mellbin & Vuille (1989) who found that rapid weight gain between the ages of seven and ten years, but

not being overweight per se, was associated with psychosocial distress in children.

These authors argue that this finding suggests that some traumatic event may trigger rapid weight increase, possibly due to hormonal imbalance caused by stress.

An alternative view is that emotional distress occurs as a consequence of being overweight, due to the prejudice and discrimination to which people who are overweight are subjected (Wadden & Stunkard, 1993). However, Wadden & Stunkard (1993) find limited evidence for differences between obese children and their normal weight peers on measures of dysphoria and self-esteem.

It has also been argued that although some studies find statistically significant differences between normal and obese children in psychological distress, these differences remain within normal limits and are not clinically significant (Wadden, Foster, Brownell & Finley, 1984). However, this may, in part, be due to the methodological shortcomings of these studies. For example, one of the early systematic studies of psychological adjustment of obese children (Sallade, 1972) used a cut-off point of the 75 centile of weight and height for age, which does not meet the generally accepted criteria for obesity. At this cut-off point children are unlikely to be visibly overweight, thus reducing the likelihood that they would have had negative experiences associated with their weight or shape.

Self-concept & self esteem

Using the Harter Self-Perception Profile for Children (Harter 1985), Banis et al. (1988) found poor self-perception in a group of 7-12 year old children who were at least 20% overweight. Hopman (1991), in her study of 8-11 year olds, also found evidence of lower self-worth in obese children, using the same measure. However, Wadden et al. (1984) found no differences.

In Hopman's (1991) study there was a negative correlation between the age of the child and self-perception, with the older children having increasingly low self-esteem. This is of particular interest in light of the finding that in pre-school children there were no differences in self esteem between normal and overweight children (Klesges, Haddock, Stein, Klesges Eck & Hanson, 1992). This suggests that low self-esteem may develop as a result of being overweight but only at an age when self consciousness increases.

Depression

There has been little research into depression in obese or overweight children (Hopman, 1991), although Strauss, et al. (1985) found that obese children rated themselves as more depressed than non-obese children. Hopman (1991) failed to find evidence of depression using the Moods and Feelings questionnaire (Costello & Angold, 1988). However, this may be partially due to the age of her sample, the majority of whom were under 10 years of age. It has been suggested that symptoms of depression rise steadily towards adolescence with a marked increase during the 11th to 12th year of age (P. Cooper & Goodyer, 1993).

Wadden, Foster, Stunkard & Linowitz (1989) also failed to find more evidence of depression in a sample of obese adolescent girls compared to a sample of normal weight peers using the Child Depression Inventory (CDI; Kovacs, 1981, cited by Wadden et al., 1989). Nevertheless, this study did identify significant levels of discontent with weight and shape in the overweight girls (Wadden et al., 1989).

In spite of the equivocal findings in relation to low self-esteem and mood in overweight children, it seems likely that there are some overweight children who do develop these symptoms and who may, therefore, be more at risk of developing eating disorders than those who are well adjusted. It is also seems likely that where a number of predisposing factors, such as concern about weight and shape, dietary restraint, low self esteem and depression converge, the risk may be increased (Garfinkel & Garner, 1982). In the following sections the possible influence of mothers' concerns about weight and shape and dietary restraint will be considered.

1.3 Mothers' role in the development of attitudes towards weight, shape and dietary restraint

Societal pressure on women to conform to an unrealistic body image, creates heightened concern with weight and dieting among women (Pike & Rodin, 1991). Hill Weaver & Blundell (1990) suggest that overvalued attitudes to weight and shape and restrictive eating practices are conveyed to children at an early age, and there is evidence that these attitudes can predate puberty (Thelen & Cormier, 1995). Thelen and Cormier suggest that parents who model weight concern and disordered eating have a

strong influence on same sexed children, who are more likely than the opposite sex children, to engage in similar behaviour. As primary caregivers, mothers are likely to be more influential in the development of attitudes towards weight and shape and dieting behaviour than fathers (Kinston et al. 1987).

1.31 Evidence of inter-generational links

Early experience

In children with infantile anorexia nervosa, mother-child interactions during feeding are characterised by more dyadic conflict, less reciprocity and more struggle for control than in dyads in which the child does not have an eating disorder (Chatoor, Egan, Getson, Menvielle & O'Donnell, 1988). This suggests that the mothers of children with anorexia nervosa may themselves be uncomfortable around food, although clearly this finding does not address the direction of the relationship. However, there is also evidence that feeding disturbances in children are specifically related to disturbed eating habits and concerns about weight and shape in mothers (A. Stein, J. Stein, Walters & Fairburn, 1995).

In a study of mothers with a history of an eating disorder (A. Stein, Woolley, S. Cooper, & Fairburn, 1994) there were more conflictual interactions at mealtimes and the infants were lighter weight than control children. In the same study, there was an inverse relationship between the weight of the child and the mother's concern about her own body shape. This suggests that the mother's concern about her own shape either directly or indirectly influences the weight of her child (A. Stein et al., 1994). Whilst

not proving causality, these studies are consistent with the hypothesis that maternal attitudes contribute to the child's acquisition of eating habits and possibly to eating psychopathology (Hill & Franklin, 1998).

Pre-adolescent children

A strong relationship between the dietary restraint of mothers and their 10 year old daughters was found by Hill, Weaver & Blundell (1990), using a dietary restraint questionnaire (Herman & Polivy, 1980, cited by Hill et al 1990) and the Eating Attitudes Test (EAT; Garner & Garfinkel, 1979); although a more recent study (Hill & Franklin, 1998) found no difference in levels of dietary restraint between the mothers of high restraint 11 year old girls and mothers of low restraint girls. However, Hill & Franklin (1998) used the DEBQ, the sub-scales of which are 'Restraint', 'Emotional' and 'External' eating. The DEBQ was designed to further the understanding of obese eating patterns (Van Strein, et al., 1986) not the psychopathology of eating disorders. It may not, therefore, be able to distinguish more disturbed eating habits or overvalued attitudes to weight and shape in mothers, because of the normative aspects of dietary concern among women (Striegel-Moore, et al., 1986).

Adolescence

In adolescence there are indications that daughters' eating habits and concerns reflect those of their mothers, in non-clinical samples. Pike & Rodin (1991) reported that mothers of girls who scored above the 75 centile on three sub-scales of the Eating Disorders Index (EDI; Garner, Olmstead & Polivy, 1983, cited by Pike & Rodin, 1991)

themselves scored significantly higher than the mothers of girls who were low scorers.

The mothers of the high scoring girls also thought their daughters should loose significantly more weight than the mothers of low scorers.

Mother-child interactions in obese children

The relationship between parent-child interaction patterns and childhood obesity are complex (Lipps Birch, Marlin, Kramer & Peyer, 1981). As with mothers and daughters in other studies (e.g. Hill, et al., 1990; Pike & Rodin, 1991), it is likely that if mothers of obese children have overvalued attitudes to weight and shape and themselves attempt dietary restraint, these attitudes will be reflected by their daughters, who may also attempt dietary restraint.

Lipps Birch, et al. (1981) observed that thinner children and their mothers ate less food and at a slower rate and talked more to each other during a lunch situation than overweight children and their mothers. Like Thelen & Cormier (1995), these authors suggest that mothers serve as models for their children's responses to food and that this is how children acquire eating habits and attitudes towards food.

Hopman (1991) found that 78 per cent of mothers were attempting to control the amount their obese children consumed in order to help them lose weight or prevent further weight gain and 17 per cent of the children were on a perpetual diet. Mothers of obese children were also more likely to weigh their children, thus emphasising the importance they placed on the weight of the child. Thelen & Cormier (1995) found that

pre-pubertal girls' body weight, their desire to be thinner and dieting were all positively correlated with parental encouragement to control weight. This is of particular concern given that Pike & Rodin (1991) found that the mothers of adolescent girls with higher scores on the EDI thought that their daughters should lose weight.

To summarise, evidence from community samples, from clinical samples, where either the mother or child shows eating related psychopathology and from studies of obese children and their mothers, all suggests that mothers' attitudes towards weight and shape and mothers' dietary restraint may play an important role in the development of children's attitudes and behaviour. However, none of these studies demonstrate causality, and it cannot be assumed that because there is a relationship between mothers' and daughters' attitudes and dietary restraint that this is because the mothers transmit these attitudes to their daughters.

In spite of this caveat, this evidence suggests that if a child is objectively overweight and their mother has overvalued attitudes to weight and shape, this may lead to the child developing concerns about their weight and shape and to attempting dietary restraint. This may be, either indirectly, through exposure and modelling their mothers' attitudes and behaviour, or because the mother directly encourages the child to diet (e.g. Hopman, 1991). Either way, this may increase the vulnerability of girls who are overweight to developing an eating disorder.

1.32 Maternal mental health

Maternal mental health may be of relevance to children who are overweight for a number of reasons. Firstly, it is well recognised that children of parents with psychiatric disorders are themselves at risk of developing disturbances (Rutter, 1989; Garnezy & Masten, 1994). Andrews, Brown & Creasey (1990) suggest that the inter-generational transmission of non-specific psychopathology between mothers and daughters can be explained by the quality of parenting and the effect of a mother's mental health status on family functioning. Where mothers are emotionally unavailable or unable to attend to the needs of the family, adverse family experiences, or traumas, are more likely to occur, which, in turn, can lead to disturbances in child development, and possibly, later mental health problems.

Secondly, an association between maternal mental health and obesity in childhood has been identified by several authors (e.g. Christoffel & Forsyth, 1989), although this link has not always been supported by empirical studies (e.g. Hopman, 1991). Favaro & Santonastaso (1995) found that mothers' mental health was associated with the degree of obesity in children and also that mothers' mental health status was more important than that of the fathers in their study.

However, Hopman (1991) found no evidence of depression or low self-esteem in the mothers of obese children. Furthermore, an anomalous study by Kinston et al. (1987) found mothers' mental health to be positively correlated with the degree of child obesity, although overall the family functioning was more dysfunctional in the families of obese children. These authors took a systemic view in the interpretation of their

results. They suggest that the obese child served a function for the family in maintaining the emotional health of the mother by being overweight and thus diverting family tension away from the mother.

In spite of the somewhat equivocal evidence discussed above, some support for the hypothesis that a child may play a role in maintaining the homeostasis of the family, comes from a study by Crisp, Harding & McGuinness (1974; cited by Garfinkel & Garner, 1982, p. 181) who found that after girls were successfully treated for eating disorders, parents showed increased psychopathology.

A third reason for considering maternal mental health is that a family history of affective disorder contributes to the risk of developing both bulimia nervosa (e.g. Fairburn et al., 1986) and anorexia nervosa (e.g. Lyon, Chatoor, Atkins & Silber, 1997), although the link with anorexia nervosa is less well established than the link with bulimia nervosa (Piran, Kennedy, Garfinkel & Owens, 1985).

Taken together, this evidence suggests that the mental health of mothers may contribute both to a vulnerability to childhood obesity and also to the development of eating disorders. However, further research is needed to clarify these links.

1.4 Theoretical perspectives, summary & rationale for the study

1.41 Cognitive-behavioural theory of eating disorders

It is generally accepted that the aetiologies of anorexia nervosa and bulimia nervosa are complex and likely to be multi-factorial (e.g. Garfinkel & Garner, 1982). However, the importance of cognitive disturbance as a central feature of eating disorders has been widely acknowledged (M. Cooper, 1997). From a cognitive perspective overvalued ideas about weight and shape are central to the development of eating disorders, whilst attitudes towards food and eating, though also important, are thought to be secondary to concerns about weight and shape (M. Cooper, 1997).

Anorexia nervosa

Garner & Bemis (1982) developed a cognitive theory of anorexia nervosa in which distorted views concerning weight and shape are of central importance. Garner & Bemis maintain that the core belief associated with anorexia nervosa is: 'I must become thin' and that losing weight will alleviate distress. Typically, people with anorexia nervosa evaluate themselves in terms of their weight and shape. Successful weight loss and subsequent feeling of control provide positive reinforcement which leads to continued efforts to avoid weight gain and remain in control of eating. There may initially be further reinforcement through positive feedback from others.

Distorted views about the self, low self esteem and depressive symptoms, have also been identified as playing a role in maintaining the symptoms of anorexia nervosa (Garner & Bemis, 1982).

Bulimia nervosa

The cognitive understanding of bulimia nervosa, developed by Fairburn, et al. (1986), is similar to that of anorexia nervosa in that overvalued, or distorted, attitudes to weight and shape are of central importance. As with anorexia nervosa, self evaluation in terms of weight and shape is typical. Fatness is viewed negatively and thinness and self-control are viewed positively. The nature of the assumptions which accompany these attitudes are dysfunctional because they are rigid and extreme and lead to dichotomous thinking and over-generalisations about food and eating and the importance of weight and shape.

The cognitive-behavioural conceptualisation of episodes of binge eating and purging is that the imposition of an impossibly strict dieting regime results in lapses of control (Fairburn, et al. 1986). These lapses are regarded as catastrophic evidence of weakness and lead to a complete abandonment of control and disinhibited eating. This is then followed by compensatory purging or intense exercising. Episodes of bingeing can also be used as a distraction from other problems or as a way of alleviating feelings of depression or anxiety (Fairburn et al., 1986). However, bingeing inevitably results in feelings of self-disgust, worthlessness and a lowering of self esteem.

1.42 Social learning theory

From a social learning perspective (Bandura, 1977) attitudes and behaviours are learnt through observation and modelling of others, most influentially the primary caregiver.

If the modelled behaviours or attitudes are reinforced, either intrinsically or extrinsically, they are more likely to be adopted into the child's repertoire.

In relation to this study, attitudes and concerns about weight, shape and eating and dietary restraint may be modelled from parents, particularly mothers. From a social learning perspective, if these attitudes and dietary restraint are positively reinforced, or encouraged, they are more likely to be adopted by the child.

1.43 Socio-cultural perspective

From a socio-cultural perspective pressure to conform to an unrealistic body image creates concern about weight and shape and dietary restraint, which are all so prevalent amongst adolescent girls in our society as to be considered normative (Hill et al., 1990). However, not all adolescent girls develop unhealthy attitudes towards weight and shape and only a small proportion develop eating disorders or are obese.

Since most children will be exposed to a similar level of media and cultural pressure to conform to a slim ideal, this suggests that societal pressure is not a sufficient explanation for the development of overvalued ideas about weight and shape. Garfinkel & Garner (1982) contend that in the development of eating disorders, parental attitudes serve to magnify a culture of weight and eating concern.

1.44 Systemic perspective

Family factors are seen as an important component in the development of both obesity and eating disorders (Bruch, 1974; Strober & Humphrey, 1987) and descriptive accounts of family dysfunction have generated considerable interest.

Systemic understanding of eating disorders draws heavily on psychodynamic theory (Garfinkel & Garner, 1982). Eating is central to early experiences of nurturing and to the way in which a mother and child interact. Bruch (1974) maintains that because of a disturbed mother-child relationship, food is substituted for emotional satisfaction, resulting in the mother offering food indiscriminately in response to the child's cries, regardless of whether or not the child is hungry. The child then comes to associate food with comfort or attention and fails to learn how to discriminate hunger from other physical or emotional needs. However, Bruch's work was based on clinical observation and empirical research into the mechanisms of family involvement in the development of eating pathology is still sparse (Strober & Humphrey, 1987).

1.45 Model

A multi-factorial model which incorporates the theoretical components outlined above, will be used in this study. From a cognitive-behavioural perspective, if attitudes to weight and shape are overvalued, self-evaluation in terms of weight and shape may result and may, in turn, lead to low self-esteem or symptoms of depression. Attitudes and beliefs about weight and shape will also influence eating behaviour and may lead to attempts at dietary restraint.

Attitudes towards weight and shape may be acquired through a combination of maternal influences and the assimilation of family attitudes and socio-cultural messages and through social learning.

1.46 Summary & rationale

The preceding review highlights the fact that concerns about weight and shape and dietary restraint are prevalent amongst young adolescent girls and can arise pre-adolescence. There is growing evidence that maternal attitudes towards weight and shape may be influential in the development of these concerns. In addition to this, some mothers may directly encourage dietary restraint in their daughters.

The review raises a number of questions about possible concerns about weight and shape and attempts of dietary restraint in overweight girls and the role of mothers in the development of their daughters' attitudes and dieting behaviour.

Girls who are overweight seem to be particularly vulnerable to developing concerns about their weight and shape and to attempting dietary restraint. They also seem to be vulnerable to low self-esteem and depression. Each of these factors are associated with eating disorders. Of particular concern are the findings reported by Hopman (1991) that obese children are being actively encouraged to diet by their mothers. If mothers of overweight girls themselves have concerns about weight and shape, and attempt dietary restraint, and their daughters assimilate these attitudes and concerns, this may put these girls at an increased risk of the later development of an eating disorder.

Overweight girls and their mothers

The aim of this study will be to investigate the concerns about weight and shape and dietary restraint in overweight girls, compared to those of average weight girls, as measured by the Child Eating Disorder Examination (CH-EDE; Bryant-Waugh, P. Cooper, Taylor & Lask, 1996). The study will also examine these concerns in relation to self-esteem and depression.

Overweight girls' mothers' concerns about weight and shape, their dietary restraint and mental health will be compared with average weight girls' mothers. Mothers' concerns and their attempts at dietary restraint will also be examined in relation to concerns and attempts at dietary restraint of their daughters in both groups.

To date, no known study has looked specifically at the concerns of overweight girls, nor compared overweight and average weight girls and their mothers.

For a number of reasons the current study will be confined to girls and their mothers rather than including boys or fathers. Firstly, there is evidence that the psychological correlates of obesity may not be the same for girls and boys (Mellbin & Vuille, 1989); secondly, the risks associated with the development of an eating disorder are more widely recognised in females. Thirdly, concerns about weight and shape and dietary restraint are more prevalent amongst females than males (Wardle & Marsland, 1990). Finally, it has been suggested that the issues and concerns about body image may be different for males (Rozin & Fallon, 1988; Wardle & Marsland, 1990).

The target age for this study will be 11-12 year old girls in their first year at secondary school. This seems to be a time when there is increasing concern about weight and shape (P. Cooper & Goodyer, 1997). It is also a crucial time for the development of negative self-esteem (Hopman, 1991) and symptoms of depression (P. Cooper & Goodyer, 1993).

1.47 Research questions:

- A) Do concerns about weight and shape and attempts at dietary restraint differ between overweight and average-weight girls?
- B) Do overweight girls have lower self-esteem, and/or more symptoms of depression than their average-weight peers?
- C) Is there a relationship between concerns about weight and shape and self-esteem and/or symptoms of depression among overweight girls?
- D) Do concerns about weight and shape and eating differ between mothers of overweight girls and mothers of average-weight girls?
- E) Is there a relationship between concerns about weight and shape and attempts at dietary restraint in girls and their mothers?

F) Is there a difference between the mental health of mothers of overweight girls and mothers of average-weight girls?

1.48 Hypotheses:

- 1) Girls in the overweight group will have more concerns about their weight and shape than those in the average-weight group.**
- 2) Girls in the overweight group will have more concerns about eating, and will show more attempts at dietary restraint, than girls in the average-weight group.**
- 3) Girls in the overweight group will have more negative ratings of self perception and higher ratings for symptoms of depression than girls in the average-weight group.**
- 4) There will be a negative correlation between weight, shape and eating concerns and self-perception, and a positive correlation with symptoms of depression among overweight girls.**
- 5) Concerns and negative beliefs about weight, shape and eating will be more prominent in mothers of overweight girls than mothers of average-weight girls.**
- 6) There will be a positive relationship between mothers' and daughters' concerns about weight, shape and eating and attempts at dietary restraint in each group.**

- 7) There will be lower self-esteem and/or more symptoms of mental health problems in mothers of overweight girls than in mothers of average-weight girls.

2. METHOD

2.1 Design

A two-sample, independent groups design was used to compare a group of overweight girls and their mothers with a control group of normal weight girls and their mothers.

2.2 Ethics approval

Ethical approval for the study was obtained from the Research Ethics Committee for the area from which the participants were recruited (see appendix 1 for letter of approval).

2.3 Participants

11-12 year old girls in year 7 of mainstream secondary school and their mothers.

2.31 Index group

Girls with a BMI of 23 or above, which corresponds to a weight-for-height ratio of at or above 120 per cent of ideal weight-for-height for their age (Cole et al. 1995; Freeman, Cole, Chinn, Jones White & Preece, 1995).

2.32 Control group

Girls with BMIs of 16-19. For their age this range represents a weight-for-height ratio of approximately 90-110 percent (Cole et al. 1995; Freeman et al., 1995).

2.33 Exclusion criteria

Girls with severe physical disability, physical or mental illness which might affect or prevent completion of the questionnaires, or girls who were not currently living with their biological mother, were excluded from the study.

2.4 Measures

2.41 For the girls

Height and weight

Self-reports of height and weight were used to calculate body mass (BMI) for recruitment of participants to the study. Those who participated were then weighed and measured at the time of the interview. A computer program, developed at Great Ormond Street hospital, which calculates the age standardised weight-for-height ratio (taking into account the expected height and weight for the child's age) (Coles, 1979) was used to determine the girls' weight-for-height centile.

Eating Disorders Examination for Children (CH-EDE; Bryant-Waugh et al. 1996)

The Eating Disorders Examination (Fairburn & Cooper, Z., 1993) is a standardised semi-structured interview schedule for the assessment of the specific psychopathology of eating disorders. The measure has recently been modified for use with children (CH-EDE; Bryant-Waugh et al. 1996) A copy of the interview schedule can be found in Appendix 2.1.

The adult version of the scale (EDE) has good discriminant validity (Fairburn & Cooper, Z., 1993) and good internal consistency of sub-scales of Weight Concern, Shape Concern, Eating Concern, Restraint and Global Concern (Z. Cooper, P. Cooper, & Fairburn, 1989). However, there have been no published studies of the test re-test reliability of this measure and there is currently no published data on the reliability or validity of the CH-EDE. Test re-test and inter-rater reliability and concurrent and divergent validity checks on the CH-EDE will therefore be carried out for this study.

Training on the administration of the adult version of EDE was given at the Warneford Hospital, and at Great Ormond Street Hospital for the CH-EDE.

Self-Perception Profile for Children (Harter, 1985)

This is a 36-item self report measure (see appendix 2.2) of self-concept which provides a profile of the child's perceived competence in five areas: Scholastic Competence, Social Acceptance, Athletic Competence, Physical Appearance and Behavioral Conduct and also gives a rating of Global self-worth. There is one sample item for practice and six items in each sub-scale with a four point ordinal scale. Reliability and validity of the measure is good and relevant data is provided with the manual (Harter, 1985).

Short Mood and Feelings Questionnaire (SMFQ; Angold, Costello, Messer, Pickles Winder & Silver, 1995)

The SMFQ is a 13 item self report measure (see appendix 2.3) designed for 8-17 year olds for assessment of core depressive symptomatology, or as a screening measure for

epidemiological studies. Each statement is responded to on a 3-point scale of 'true', 'sometimes true' or 'not true'. Initial reports of reliability and validity of this measure are satisfactory (Angold et al., 1995). Four positive items were added at the end of the questionnaire, but not included in the analysis, in order to reduce the negative impact of the questions, after Hopman (1991).

2.42 For the mothers

Eating Disorders Examination-Questionnaire (EDE-Q; Fairburn and Beglin, 1994)

This is a self-report questionnaire version of the EDE (see appendix 2.4) developed for research purposes. Sub-scales scores for, Weight Concern, Shape Concern, Eating Concern, Restraint and Global Concern can each be derived from the questionnaire.

The measure generally shows close agreement with the interview schedule, although on less well defined items and complex features of eating disorder there is some discrepancy (Fairburn & Beglin, 1994). However, as the purpose was to investigate general concerns and dietary restraint in a community sample, not to assess the complex clinical features of eating disorders in this population, the questionnaire was considered adequate for this study.

Eating Disorder Beliefs Questionnaire (EDBQ; M. Cooper, Cohen-Tovee, Todd, Wells & Tovee, 1997)

This is a recently developed 32 item measure designed to assess assumptions and beliefs relevant to eating disorders (see appendix 2.5). The EDBQ has four factors:

Negative Self Beliefs, Weight and Shape as a means to Acceptance by Others, Weight and Shape as a means to Self Acceptance and Control over Eating. Preliminary data suggest that the validity and reliability of this measure are good (M. Cooper, et al. 1997).

Eating Attitudes Test (EAT; Garner and Garfinkel, 1979)

This is a well established questionnaire widely used for research into eating habits and eating disorders (see appendix 2.6). The EAT provides a global score of eating disturbance and has good psychometric properties (Garner and Garfinkel, 1979).

Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965)

The RSE is a 10 item questionnaire for measuring global self-esteem (see appendix 2.7). A four point response scale, ranging from 'strongly agree' to 'strongly disagree' was used, with a high score reflecting high self-esteem. The RSE is a widely used measure with good reliability and validity.

General Health Questionnaire (GHQ-12; Goldberg, 1992)

This is a well established self-report screening measure designed to assess mental health in community and non-psychiatric clinical settings. The 12 item version of the measure was used in this study (see appendix 2.8). This version of the measure has a Likert scoring range of 0-4 for each statement.

2.43 Measures for checking reliability and validity of CH-EDE:

Eating Habits Questionnaire (EHQ; Hopman, 1991)

This measure was devised by Hopman (1991) (see appendix 2.9) for her study of obese children. This is a brief questionnaire for mothers to complete about their children's exercise and eating habits, and the mothers' attitudes towards these issues. This was included as a check for concurrent validity of the CH-EDE.

Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997)

This is a recently developed measure with five sub-scales, for completion by parents or teachers (see appendix 2.10). The sub-scales are: Prosocial Behaviour, Hyperactivity, Emotional Symptoms, Conduct Problems and Peer problems. This measure was included in order to check the divergent validity of the CH-EDE, as no association between the two measures would be expected on the Prosocial Behaviour, Hyperactivity or Conduct Problems sub-scales.

The advantage of the SDQ is that it has been developed in this country, for children within the age range of this study and is short and easy to complete. Preliminary psychometric properties appear to be good (Goodman, 1997).

2.5 Procedure

2.51 Recruitment and screening

Fourteen secondary schools (11 state and 3 independent schools) were approached with regard to taking part in the study by distributing letters to all Year 7 girls. Six state schools, but none of the independent schools, agreed to participate. A consortium of three state schools took particular interest in the study and the recruitment procedure and correspondence for the participants was developed in consultation with the heads of these schools.

A total of 650 recruitment letters with reply slips and stamped addressed envelopes to the investigator were distributed by the six schools (see appendix 3.1 for recruitment letter and reply slips). No further involvement of the schools was required.

The reply slips were divided into two sections, the first section giving birth date, height and weight of the child and the second section giving names, contact address and telephone number of those willing to be contacted about taking part in the study. This allowed families to return the slip, with height and weight information whilst remaining anonymous.

BMI was calculated from the girls' self-reported height and weight. Those who met the criteria for the index group were then approximately matched for height, birth date and school with a girl within the average BMI range. This was in order to keep the variance between the two groups, on these measures, approximately equal.

A letter and information sheet was then sent to each of the selected mothers and daughters inviting them to participate in the study (See appendix 3.2). This was followed up with a telephone call to discuss any issues which were unclear and to arrange an appointment if both of them were willing to participate. At each stage it was made clear that potential participants were free to choose whether or not they wanted to proceed, and at each stage they were offered the opportunity to ask questions.

2.52 Dairies

After the appointment was arranged a confirmation letter was sent to potential participants together with an activity diary sheet (see appendix 3.3) to complete for the 4 weeks prior to the interview date and to identify any significant events from the previous two months. This practice, developed at Great Ormond Street, reduces the time taken at the beginning of the interview in orientating the child to the period of time spanned by the CH-EDE interview.

2.53 Interviews

The interviews took place in the participants' homes. The purpose of the study and the procedure was explained to the mothers and daughters together, using a standard format (see appendix 4). Both mothers and daughters were encouraged to ask questions. If they wished to proceed they were then both asked to sign the consent forms. The mothers were then asked to complete their questionnaires while the girls were interviewed on their own. The CH-EDE interviews were recorded on audio-tape with both the mothers' and girls' permission.

After the CH-EDE interview the girls completed their self-report questionnaires and were weighed and measured. The procedure took 1- 1 1/2 hours in total. At the end of the session both the girls and their mothers were de-briefed and asked if they had any queries or comments. They were also asked if they would be willing to be contacted about re-testing, to provide data for the test re-test of the CH-EDE.

2.54 Re-test

Eighteen participants agreed to be re-tested on the CH-EDE interview. For these interviews the procedure was as above but with a shortened introduction to the study and procedure. The re-test interviews took place 2-5 weeks after the initial visit.

2.55 Inter-rater reliability

Ten, randomly selected, audio-taped interviews were rated by an independent rater, trained and experienced in the administration of the CH-EDE. Permission to have the tapes listened to by a colleague was sought from all participants before the interview began.

2.56 Contingence for disclosures

Contingency plans for participants who showed symptoms of eating disorder, or made other disclosures during the interview were discussed with the research supervisor. It was agreed that any concerns would be discussed with the supervisor and appropriate action taken according to the individual case.

2.57 Feedback

Each of the participating schools and the participants will be sent a summary of the research findings.

2.6 Data analysis

The data was analysed using the statistical package SPSS (SPSS, Inc., 1997).

The raw data from the interviews and questionnaires was ordinal scaled, so where individual items were used for analysis non-parametric tests were applied. Where items were combined to derive sub-scale or global scores interval scaling was assumed. Checks for normality of distribution and equality of variance were made using the Kolmogorov-Smirnov and Levene tests respectively for each group. Where the data failed to meet the criteria for parametric analysis non-parametric equivalents were substituted. Most notably the CH-EDE and EDE-Q sub-scales were either not normally distributed or had significantly unequal variances between the two groups, due, in part, to the low reporting of symptoms in the control group. Analysis of EDE data therefore used non-parametric tests, i.e. Mann-Whitney U and Spearman correlation coefficients. T-tests were used to analyse the Harter Self-Perception Profile sub-scales and the RSE as each of these met the criteria for parametric analysis.

For the reliability and validity analysis of the CH-EDE, two-tailed tests were used as the direction of any differences were not predicted. Where the expected direction of the difference was stated in the hypotheses, one-tailed tests were used.

3. RESULTS

3.1 Sample

3.11 Response rate

Of the 650 letters distributed to six schools, 139 reply slips were returned (21.38%), of which 17 were anonymous. From these replies 18 girls were identified as having BMIs of 23 or above. At this age this equates to a height-for-weight ratio of 120 per cent or above. These 18 girls constituted the index group and were then matched for height, age and school with 18 girls with BMIs of 16-18, which equates to a weight-for-height ratio of approximately 90-110 per cent of expected weight-for-height for their age.

Five potential participants from the control group withdrew from the study, and were replaced from the pool of responders.

3.12 Descriptive data analysis

Girls

All the girls who participated were in year 7 of state secondary school. The mean age of the index group at the time of the interview was 11 years 9.6 months and of the control group 12 years. A t-test showed that this difference was not significant.

The mean weight-for-height ratios, and height centiles related to age, of the two groups are shown in Table 1.

Table 1. Mean weight-for-height ratios, & height centiles by group

	Index group(<i>N</i> =18)	Control group (<i>N</i> =18)	t-test value (d.f.)
	M (SD)	M (SD)	
W4H ^a	136.14 (16.35)	95.05 (6.88)	9.82 (34) ***
Height ^b	76.44 (26.27)	56.97 (35.88)	1.86 (34)

****p* < .001

^aW4H = Weight-for-height ratio;

^bheight = height centiles related to age

Six of the index group had reached menarche, whereas none of the control group had.

This was a significant difference (Fisher’s Exact Test, *p* < .05).

Mothers

The mean age of the mothers in the index group was 38.1 years (*N* = 15; SD = 4.28) and in the control group 41.1 years (*N* = 17; SD = 6.16). This difference was found to be non-significant, using a two-tailed t-test. The different numbers in the two groups was due to missing data.

There was a significant difference in the BMIs of the mothers in the index group and of those in the control group with mothers in the index group having higher BMIs than the control group (index group: *M* = 29.5, *N* = 17; SD = 5.22, control group: *M* = 23.94, *N* = 18; SD = 3.21; *t* = 3.82, d.f. = 33, *p* < .001, two-tailed). Once again there was some missing data from the mothers.

3.13 Social class

The social class distribution of the two groups is shown in Table 2. The registrar general’s classification method (Office of Population Censuses and Surveys, 1990) was

used to check that there were no differences between the two groups in social class distribution, based on the occupation of the head of the household. However, the limitations of classifying participants in this way are acknowledged (Mascie-Taylor, 1990).

Table 2. Social class distribution for the index and control groups

	Social Class (<i>N</i> = 36)			
	1 & 2 ^a	3	4 & 5 ^a	Missing
Index group	9	5	3	1
Control group	11	2	2	3

^a Due to small numbers in categories 1 and 5 these columns were combined with columns 2 and 4 respectively.

Inspection of the table suggested that the distributions in the two groups was similar. Due to the number of cells with expected frequencies of less than 5, a chi-square test for significance was not possible (Rees, 1985).

3.14 Eating pathology

Girls

There were no indications from the CH-EDE that any of the girls, from either group, met the criteria for any form of eating disorder; none of the girls reported any episodes of objective overeating, fasting, self-induced vomiting, laxative or diuretic misuse and none of them reported excessive or intense exercising. None of the girls in the control group were below 85% of their expected weight-for-height and did not, therefore, meet the criteria for anorexia nervosa.

Mothers

The number of mothers reporting fasting, objective episodes of overeating, loss of control over eating, laxative misuse or intense exercising, on the EDE-Q, are shown in Table 3. Where the expected cell frequencies were greater than 5, Chi-square tests, were used to test for the significance of these differences. None of these differences were significant. None of the mothers reported self-induced vomiting or use of diuretics within the four week period covered by the questionnaire. None of the mothers were below 85% of their expected weight-for-height and none had a BMI of less than 19, the cut-off for healthy weight range in adults (Livingstone & Bray, 1989).

Table 3. Mothers' fasting, overeating, laxative misuse & intense exercising

EDE-Q ^a items:	Index group (N=18)		Control Group (N= 18)	
	Mothers (N)	Episodes (Range)	Mothers (N)	Episodes (Range)
Fasting	5	1-6	1	1
Objective overeating	8	2-6	3	3-28
Loss of control	5	2-6	2	10-14
Laxative misuse	1	4	0	0
Intense exercising	2	2-4	3	5-28

^aEDE-Q = Eating Disorders Examination - Questionnaire

3.2 Reliability & Validity of the CH-EDE

3.21 Inter-rater reliability

Inter-rater reliability was checked item by item using Wilcoxon matched pairs sign rank tests. A significance level of 1% was adopted because of the large number of tests being performed. None of the items were scored significantly differently by the two raters.

Cross tabulations, using Kappa coefficients, were also made to check for correlation between raters. On ten items Kappa calculations were not possible because there was only one cell or column of data, which meant that at least one variable was a constant, or that there was complete agreement between raters. The strength of agreement (Landis & Koch, 1977) for the remaining 27 items ranged from: Almost perfect (0.81-1.00) 14 items, Substantial (0.61-0.80) 6 items, Moderate (0.41-0.60) 4 items, Fair (0.21-0.40) 2 items, Slight (0.00-0.20) 1 item.

3.22 Test re-test reliability

The test re-test reliability of the interview was also assessed item by item using Wilcoxon matched pairs sign rank tests. Again, a significance level of 1% was used because of the large number of tests being performed. None of the items were significantly different at the 1% level. Cross tabulations, using Kappa coefficients, were also carried out to check for correlation between each item for the two occasions of testing. The strength of agreement of the Kappa scores (Landis & Koch, 1977) ranged from: Substantial (0.61-0.80) 2 items, Moderate (0.41-0.60) 8 items, Fair (0.21-0.40) 6 items, Slight (0.00-0.20) 5 items and Poor (<0.00) 7 items. Kappa scores could not be calculated for 17 items because there was only one cell or column of data, which meant that at least one variable was a constant, or that there was complete agreement between raters.

3.23 Concurrent validity

Items from the Eating Habits Questionnaire (EHQ), which might be expected to correlate with sub-scales from the CH-EDE were used to check the concurrent validity of the CH-EDE using Spearman correlations. Table 4 shows the correlations between sub-scales of the CH-EDE and items from the EHQ.

Table 4. Correlations between sub-scales of CH-EDE & items from the EHQ

	EHQ ^b Item 7: Regular meals to control weight or shape	EHQ ^b Item 10: Limits on sweet food	EHQ ^b Item 12: Limits on fatty food
Restraint ^a	.50**	.38*	.49**
Eating Concern ^a	.40**	.13	.45**
Shape Concern ^a	.66***	.38*	.50**
Weight Concern ^a	.69***	.42**	.48**
Global score ^a	.61***	.36*	.55***

N=36 : **p*< .05 ** *p*< .01 ****p*< .001 Two-tailed
^aChild Eating Disorders Examination (CH-EDE) Sub-scales
^bEHQ = Eating Habits Questionnaire

3.24 Divergent validity

Three sub-scales from the Strengths and Difficulties Questionnaire (SDQ) were used to check the divergent validity of the CH-EDE sub-scales using Spearman correlation coefficients. The correlations between the sub-scales of the CH-EDE and SDQ are shown in Table 5. As this table shows, whilst there were no significant correlations between any of the CH-EDE sub-scales and the Prosocial Behaviour sub-scale of the SDQ, there were a number of significant correlations between each of the other sub-scales except ‘Restraint’.

Table 5. Correlations between CH-EDE & SDQ sub-scales

	SDQ ^b sub-scales:		
	Prosocial Behaviour	Hyperactivity	Conduct Problems
Restraint ^a	.21	.12	.08
Eating Concern ^a	-.03	.39*	.19
Shape Concern ^a	-.06	.33*	.43**
Weight Concern ^a	-.18	.46**	.49**
Global score ^a	-.06	.36*	.45**

N = 36: **p* < .05 ** *p* < .01 ****p* < .001 Two-tailed
^aChild Eating Disorders Examination (CH-EDE) Sub-scales
^bSDQ = Strengths and Difficulties Questionnaire

3.3 Hypotheses testing

H1) Girls in the overweight group will have more concerns about their weight and shape than those in the average-weight group.

Mann-Whitney tests for between groups differences were used to test this hypothesis.

On the Weight Concern sub-scale of the CH-EDE the index group had significantly higher scores than the control group (index group: *M* = 1.6, *SD* = 1.1; control group: *M* = .36 *SD* = .49; *U* = 42.5, *p* < .0001, one-tailed).

On the Shape Concern sub-scale of the CH-EDE the index group also had significantly higher scores than the control group (index group: *M* = 1.6, *SD* = 1.2; control group: *M* = .33, *SD* = .38; *U* = 45.5, *p* < .001, one-tailed).

These results therefore support the first hypothesis.

H2) Girls in the overweight group will have more concerns about eating, and will show more attempts at dietary restraint, than girls in the average-weight group.

Again, Mann-Whitney U tests for between groups differences were used to test this hypothesis.

On the Eating Concerns sub-scale of the CH-EDE the index group had significantly higher scores than the control group (index group: $M = .41$ $SD = .64$; control group: $M = .08$, $SD = .22$; $U = 106.5$, $p < .05$, one-tailed). On the Restraint sub-scale of the CH-EDE the index group also scored significantly higher than the control group (index group: $M = .73$, $SD = .68$; control group: $M = .21$ $SD = .56$; $U = 78.0$, $p < .005$, one-tailed).

There was no significant difference between the two groups in their reported eating of main meals, i.e. breakfast, lunch and supper but the index girls reported eating significantly fewer mid-morning snacks than the control group (index group: $M = 3.4$, $SD = 1.5$; control group: $M = 4.7$, $SD = 1.38$; $U = 1.5$, $p = .01$, one-tailed). The index group also reported eating significantly fewer evening snacks than the control group (index group: $M = 2.1$, $SD = 2.2$; control group: $M = 3.6$, $SD = 2.2$; $U = 98.0$, $p < .025$, one-tailed). This suggests that the index group may have been attempting to restrain their eating more than the control group.

Overall, these results support the second hypothesis.

Because the girls in the index group had significantly higher weight-for-height ratios than the control group girls, their increased concerns about weight, shape and eating may have been simply due to their weight. Spearman correlation coefficients were calculated to check whether there was a relationship between the level of concern and weight-for-height ratios in the girls. Because of the difference in the mean weight-for-height ratios and CH-EDE sub-scale scores of the two groups, these were analysed separately for each group. There were no significant correlations found between any of the CH-EDE sub-scales and weight-for-height ratio within either group.

H3) Girls in the overweight group will have more negative ratings of self perception and higher ratings for symptoms of depression than girls in the average-weight group

There were no significant differences between the two groups, using t-tests for independent samples, on the Harter Self -Perception Profile sub-scales for Behavioural Conduct, Scholastic Competence or Social Acceptance. However, the index group showed significantly more negative perception than the control group, on the sub-scales for Athletic Competence (index group: $M = 13.7$, $SD = 1.1$; control group: $M = 17.9$, $SD = 3.7$; $t = 3.60$, $d.f. = 34$, $p = .001$, one-tailed), Physical Appearance (index group: $M = 13.2$, $SD = 3.4$; control group: $M = 18.2$, $SD = 3.8$; $t = 4.00$, $d.f. = 34$, $p < .001$, one-tailed), and Global Self-worth (index group: $M = 17.22$, $SD = 3.9$; control group: $M = 19.5$, $SD = 2.6$; $t = -2.10$, $d.f. = 34$, $p < .05$, one-tailed).

The score for the SMFQ was just significantly higher in the index group than in the control group (index group: $M = 6.1$, $SD = 4.9$; control group: $M = 3.7$, $SD = 2.8$; $U = 109$, $p < .05$, one-tailed), using a Mann-Whitney U test.

The third hypothesis was therefore partially supported.

H4) There will be a negative correlation between weight, shape and eating concerns and self-perception, and a positive correlation with symptoms of depression among overweight girls.

Spearman correlation coefficients were used to test this hypothesis.

The relationships between the Weight, Shape, Eating and Global sub-scales of the CH-EDE, and the Harter Self-Perception Profile sub-scales and SMFQ scores are shown in Table 6. There were no significant correlations between Behavioural Conduct, Scholastic Competence or Social Acceptance sub-scales of the Harter Self-Perception Profile and the sub-scales of the CH-EDE so these are therefore not included in the Table.

Table 6. Relationships between eating, weight and shape concerns with self-perception and symptoms of depression in the index group

	CH-EDE ^a Sub-scales			
	Weight Concern	Shape Concern	Eating Concern	Global Concern
Athletic Competence ^b	-.38	-.50*	-.40*	-.46*
Physical Appearance ^b	-.51**	-.63**	-.61**	-.57**
Global Self-worth ^b	-.49*	-.37	-.24	-.38
SMFQ ^c	.37	.23	.45*	.22

N = 18 : * *p* < .05 ** *p* < .01 One-tailed
^aCH-EDE = Child Eating Disorders Examination
^bHarter Self-Perception Profile Sub-scales
^cSMFQ = Short Mood and Feelings Questionnaire

As can be seen from Table 6, there were significant negative correlations between each of the CH-EDE Concern sub-scales and Physical Appearance sub-scale of the Harter Self-Perception Profile. There were also significant negative correlations between Athletic Competence and Shape, Eating and Global Concern, and between Weight Concern and Global Self-Worth. There was also at significant positive correlation between SMFQ and Eating Concern.

The correlations shown in Table 6 lend some support to the fourth hypothesis.

H5) Concerns and negative beliefs about weight, shape and eating and will be more prominent in mothers of overweight girls than mothers of average-weight girls.

Using Mann-Whitney U tests, the mothers in the index group had significantly higher scores than the index group on every sub-scale of the EDE-Q and the EDBQ and on the global score of the EAT. These results can be seen in Table 7.

Table 7. Mothers’ concerns and beliefs about weight, shape and eating

Sub-scales:	Mean scores (SD)		Mann-Whitney U
	Index (N=18)	Control (N=18)	
Weight Concern (EDE-Q) ^b	2.83 (1.1)	1.22 (1.6)	U = 71.5***
Shape Concern (EDE-Q) ^b	3.78 (1.3)	1.67 (1.8)	U = 70.0***
Eating (EDE-Q) ^b	1.34 (1.0)	.68 (1.4)	U = 81.5***
Restraint (EDE-Q) ^b	2.03 (1.4)	1.09 (1.7)	U = 68.5***
Global Concern (EDE-Q) ^b	2.49 (.96)	1.08 (1.5)	U = 70.0***
Negative Self-beliefs (EDBQ) ^c	23.89 (23.5)	11.72 (19.3)	U = 91.5**
Acceptance by Others(EDBQ) ^c	20.62 (26.1)	11.41 (22.8)	U = 102.0*
Self-acceptance (EDBQ) ^c	52.93 (26.1)	36.46 (29.7)	U = 102.0*
Control over Eating (EDBQ) ^c	17.33 (18.2)	7.56 (17.4)	U = 90.0**
EAT ^d	18.06 (11.22)	9.61 (10.8)	U = 62.0***

p* < .05 *p* < .01 *** *p* < .001 One-tailed

^aBMI = Body Mass Index

^bEDE-Q = Eating Disorders Examination Questionnaire

^cEDBQ = Eating Disorders Beliefs Questionnaire

^dEAT = Eating Attitudes Test

Although the results shown in Table 7 support hypothesis 6, because the mothers in the index group had significantly higher BMIs, their increased concern and negative beliefs about weight, shape and eating may have been due to their weight. Spearman

correlation coefficients were calculated to see whether mothers' BMI and the EDE-Q and EDBQ sub-scales and the EAT score were positively correlated. Because the BMI and sub-scale score means of the two groups were different, these correlations were made separately for each group. The correlations are shown in Table 8.

Table 8. Correlations between mothers' BMIs & sub-scale scores for the EDE-Q, EDBQ and EAT scores

Sub-scales:	BMI	
	Index (N=18)	Control (N=18)
Weight Concern (EDE-Q) ^b	-.24	.81***
Shape Concern (EDE-Q) ^b	-.27	.76***
Eating (EDE-Q) ^b	-.34	.80***
Restraint (EDE-Q) ^b	-.60**	.45
Global Concern (EDE-Q) ^b	-.46	.79***
Negative Self-beliefs (EDBQ) ^c	-.10	.49*
Acceptance by Others(EDBQ) ^c	.09	.53*
Self-acceptance (EDBQ) ^c	-.46	.54*
Control over Eating (EDBQ) ^c	-.37	.70***
EAT ^d	-.36	.22

p*< .05 *p*< .01 *** *p*< .001 One-tailed

^aBMI = Body Mass Index

^bEDE-Q = Eating Disorders Examination Questionnaire

^cEDBQ = Eating Disorders Beliefs Questionnaire

^dEAT = Eating Attitudes Test

H6) There will be a positive relationship between mothers' and daughters' concerns about weight, shape and eating and attempts at dietary restraint in each group.

Spearman correlation coefficients were used to examine the relationship between mothers' and daughters' sub-scale scores for Weight, Shape, Eating and Global Concerns and Restraint in the two groups separately, because the means of the two groups were different. Using the corresponding sub-scales from the EDE-Q and CH-EDE for mothers and daughters respectively, there were no significant correlations between mothers and daughters in the index group. In the control group ($N=18$) there were significant correlations on three sub-scales: Weight Concern ($.54, p = .01$, one-tailed) Eating Concern ($.46, p < .05$, one-tailed), and Global Concern ($.56, p < .01$, one-tailed). The Shape Concern and Restraint sub-scales were not significantly correlated in the control group.

Whilst the correlations found between mothers and daughters in the control group lend some support to hypothesis 5, the lack of any correlation between mothers and daughters in the index group qualifies this support.

In order to check whether the correlations between mothers and daughters may be a reflection of weight, mothers' BMI was correlated with the girls' weight-for-height ratio in each group. Using Spearman correlation coefficients there was no significant correlation between mothers and daughters in the index group, but in the control group there was a significant correlation ($N = 18, .59, p < .01$, two-tailed).

H7) There will be lower self-esteem and/or more symptoms of mental health problems in mothers of overweight girls than in mothers of average-weight girls.

Using an independent samples t-test, there was no significant difference in the mothers' self-esteem as measured by the RSE. Using a Mann-Whitney U test, there were just significantly more symptoms of depression as measured by the GHQ-12 in the mothers in the index group than those in the control group (index group, $M = 14.61$, $SD = 8.7$; control group, $M = 9.61$, $SD = 4.22$; $U = 105.5$, $p = .05$, one-tailed).

This hypothesis was therefore partially supported.

3.4 Regression analysis

Because the girls' in the index group were, by definition of higher weight than the control group it is possible that their concerns were due to their weight. As the mothers of the overweight girls also had significantly higher BMIs than the mothers of the control group girls it is also possible that their increased concern about their own weight was reflected by their daughters.

In order to investigate what contributed most to the girls concerns, their weight-for-height ratio, the mothers' BMIs and mothers' sub-scale scores from the EDE-Q were entered into a regression analysis, with the girls' Global sub-scale score of the CH-EDE as the dependent variable. The unstandardised residuals of the dependent variable were tested to see if they differed significantly from a normal distribution. Using the 1-

sample Kolmogorov-Smirnov test for normality, there were no significant differences. The assumptions for a regression analysis were therefore met. The independent variables entered into the regression model step-wise as this method takes account of any co-linearity between the independent variables.

When girls' Weight-for-height ratio, mothers' BMI, and mothers sub-scales of the EDE-Q were entered stepwise into the regression, mother's Weight Concern accounted for most of the variance ($R^2 = .26$, d.f. = 1, 34; $F = 14.26$; $p < .001$) followed by girls' weight-for-height ratio which increased the proportion of the variance explained by the model ($R^2 = .38$; d.f. = 2, 33; $F = 10.12$; $p < .001$). The other variables did not contribute significantly more to the variance.

4. DISCUSSION

4.1 Summary of findings

The results either support, or partially support, each of the hypotheses. The overweight girls had significantly higher scores than the average-weight girls on the CH-EDE sub-scales for Weight, Shape and Eating Concerns and Restraint. The overweight girls also had significantly lower ratings for self-perception on three sub-scales of the Harter Self-Perception Profile: Athletic Competence, Physical Appearance and Global Self-worth, and just significantly higher scores for symptoms of depression, as assessed by the SMFQ, than the average-weight girls' scores. This suggests the overweight girls had more concerns about their weight, shape and eating and were attempting dietary restraint significantly more than the average weight girls and that the overweight girls also had somewhat lower self-esteem and more symptoms of depression than the average-weight girls.

As a group, overweight girls showed some association between concerns about weight, shape and eating, self-perception and symptoms of depression. The most significant correlations were between the Physical Appearance sub-scale of the Harter Self-Perception Profile and the Weight, Shape, Eating and Global Concern sub-scales of the CH-EDE.

The mothers of overweight girls also showed significantly higher scores, than mothers or average weight girls, on each of the sub-scales for the EDE-Q and the EDBQ suggesting that mothers of overweight girls had more concerns and negative beliefs

about weight, shape and eating, and made more attempts at dietary restraint. The global score of the EAT, which was also significantly higher suggests that the mothers of overweight girls may have had more disturbed eating habits and attitudes towards food as well.

In the control group, but not in the index group, there was a significant relationship between mothers' and daughters' levels of concern as measured by the EDE sub-scales: Weight, Eating and Global Concern. There was no significant relationship between the Shape Concern or Restraint sub-scales in either group.

The mothers of the overweight girls had just significantly higher scores on the GHQ-12, suggesting that they may have had slightly more symptoms of mental health problems than the mothers of average weight girls, but there was no significant difference in self-esteem between the two groups of mothers.

4.2 Methodological issues

Whilst these results lend support, or partial support, to each of the hypothesis there are a number of methodological issues which need to be addressed. There are also some caveats which qualify the findings.

4.21 Design of the study

Because a cross-sectional group design was used in this study, any interpretation of the results must be qualified by the fact that the results are only indications of group

differences and may obscure individual differences within each of the groups. This point will be taken into consideration in the interpretation of the results and in considering their clinical implications. Secondly, the cross-sectional design also prevents interpretation of the results in terms of causality of any associations which were found.

4.22 Significance of the findings

The non-parametric nature of the majority of the data reduced the power of the analysis that was possible. The use of a 5% significance level was made on the basis that this would indicate any significant trends in the data. However, the level of reporting of symptoms on the CH-EDE did not indicate eating disorders in either group, and the scores for the SMFQ although higher in the overweight girls group, did not reach the clinical cut-off point of 8 (Angold et al., 1995). This suggests that the results of the study, whilst interesting, may not be clinically significant. However, one of the aims of the study was to examine possible differences between the two groups of girls that might explain why girls who are overweight in childhood are particularly at risk of developing an eating disorder later in life. To some extent this has, therefore, been achieved by demonstrating statistically significant differences between the two groups of girls and their mothers, on variables which are known to be vulnerability factors in the development of eating disorders (e.g. Fairburn et al., 1986; Garner & Bemis, 1982).

4.23 Sample & response rate

The response to the letters sent out by the schools (21%) was quite low, which was predictable, both because of the method of recruitment, i.e. getting children to deliver the letters home and then to opt in to the study, and also because of the relatively sensitive and time consuming nature of the interview. From the feedback received by those who withdrew from the study, it was apparent that girls of this age can feel very self-conscious about talking to a stranger, especially about sensitive issues such as their eating habits, and concerns about their weight and shape. Because the participants were self-selected this may have biased the sample towards either girls or mothers who were particularly interested or concerned about the topic of research.

4.24 Use of the CH-EDE

The EDE was originally designed for the assessment of the specific psychopathology of eating disorders in adults and can also be used as a diagnostic tool (Fairburn & Z. Cooper, 1993). In addition to female adult norms for anorexia nervosa and bulimia nervosa, norms are provided for normal controls, restrained eaters, dieters and overweight subjects.

The adult version of the EDE has been used in a large scale survey of eating habits and attitudes in 11-16 year old girls (P. Cooper & Goodyer, 1994). However, P. Cooper and Goodyer, noted that particular care needed to be taken with some of the items for the younger children. The CH-EDE has subsequently been adapted from the adult version for clinical assessment of children with eating disorders and for research purposes

(Bryant-Waugh, et al., 1996). This made it an appropriate choice of measure for this study. However, extensive psychometric testing of the CH-EDE has yet to be carried out.

The advantage of using an interview schedule rather than a self-report measure is that it is possible to adapt the language of the questions so that they can be clearly understood by the children, whilst keeping within the clear framework of the schedule. The use of an interview also allows more in depth exploration of the concepts, and sensitive questioning can elicit more information from the child than would be possible from a self-report measure. As (Huon et al., 1997) point out, children of this age can be suggestible, which may affect the reliability of reports of high levels of dieting behaviour and body image dissatisfaction in this age group. Huon et al. (1997), argue that care should be taken in the wording of questions and interviewing style, for example, by not phrasing the questions in a way which suggests a desired direction of the response, and by not asking leading questions. This was taken into consideration when interviewing the children for this study. In particular, care was taken to avoid asking leading questions.

Although the CH-EDE is relatively long to administer to children (approximately 1 hour), it was well accepted by most participants. The questions were felt to be relevant to the concerns of young girls with, or without, eating problems, and the interview gave them a chance to describe their concerns in a context where they were being listened to carefully. Frampton (1996), in a study using the measure with a community sample of children, also found it to be well accepted and relevant. Frampton (1996), concluded

that the measure is a valuable screening tool for the detection of cognitions and concerns about weight, shape and eating before major eating pathology sets in.

However, whilst this measure did discriminate between the two groups, some drawbacks have been identified. As Frampton (1996) points out, some of the items are attempting to tap into complex issues which children may be unable to grasp adequately. Frampton (1996) argues that some of the questions may require additional 'translation' from the adult version to make them sufficiently comprehensible to younger participants.

In this study, most of the girls seemed able to grasp the concepts under investigation adequately, although the reliability of their responses may have been questionable, given the relatively poor test-retest performance of the measure, which will be discussed below.

One of the problems encountered in this study was that the strict criteria for scoring items resulted in many of the girls, especially in the control group, scoring nothing on most of the sub-scales. Whilst for some children this appeared to be an accurate reflection of their lack of concern about their weight and shape or their dietary restraint, for others there was a clinical sense that these issues did concern them, but not to a sufficient extent for them to meet the CH-EDE scoring criteria.

The low level of reporting in this study may be due to a tendency for participants not to report eating problems or associated worries, since they could not make sense of their

own behaviour. In light of the finding by French et al. (1998) that children report significantly more disturbed eating patterns through questionnaire assessment than when interviewed, this may account for the low level of reporting in the present study. However, as French et al. (1998) concluded, it is not possible to tell which method of assessment is more accurate.

The clinical impression in this study was that some of the girls, particularly in the index group, may have adopted a strategy of denial in response to questioning. The low sensitivity of the CH-EDE in the face of denial is discussed by Bryant-Waugh et al. (1996), who point out that one of the difficulties of assessing eating disorder patients is that a proportion of them deny having any problems or worries, despite sensitive questioning.

Inter-rater reliability of the CH-EDE

The Kappa coefficients showed that there was generally good inter-rater agreement between the interviewer and the blind rater on their item by item scoring decisions. The one item which performed poorly showed a discrepancy between the raters for three out of ten of the interviews which were checked. This item asked about dietary rules. To meet the criteria for scoring 'dietary rules' the interviewer must elicit definite rules, rather than general guidelines, made to try to change weight or shape and implying distress if the rules are broken. It was sometimes difficult to determine whether rules or general guidelines were being elicited. The two raters failed to agree on this point in three cases.

There were no significant discrepancies between the two raters for any of the items using a Wilcoxon matched pairs sign rank test.

Ideally, a higher proportion of the tapes would have been blind rated but this was precluded due to time constraints. In addition to providing evidence for the reliability of the measure by demonstrating that a blind rater can reach the same scoring decisions as the interviewer, the strong agreement suggests that the measure can be used confidently by different raters.

Test-retest reliability of the CH-EDE

The results of test-retest reliability were less satisfactory. This may have been due to a number of factors. Firstly, the interval between the first and second testing was between 2-5 weeks. In the life span of a child, recently started at secondary school, this may seem to be a long time, during which attitudes and concerns may change. In retrospect a shorter interval may have yielded more consistent results.

Secondly, because the questions are retrospective, covering the previous month, the time period under examination was not the same at time one and time two thus confounding the results. This was particularly problematic as much of the initial data was collected either directly before, or directly after, the Christmas holidays, a time of year which altered the childrens usual patterns of eating, and possibly their attitudes towards weight, shape and eating. For example, many of the girls expressed concern that they had overeaten and/ or that they had put on weight over Christmas and were subsequently attempting to restrain their eating in the new year. In cases where the first

visit was made in January, and the re-test visit in February, the differences in responses may have been because they were no longer concerned about their Christmas indulgence, and were no longer attempting dietary restraint as a consequence.

Thirdly, the re-test interview may have been regarded by the children as more tedious than the initial interview. Having been through the interview once the girls would be well aware that an emphatic, or uninterested 'no' in response to the initial probe question was usually taken at face value, at which point the interview proceeded to the next question. This meant that at the time of re-testing, the children may have learnt that the quickest way to get through the interview was to deny any concerns or fears.

It is also possible that the process of taking part in the study, and possibly talking to their family or friends about the experience, may have altered their attitudes and concerns. Interestingly, the re-test data indicates that the direction of the discrepancies was towards a reduction in scores, supporting the impression that the children just wanted to get the interview over with on the second occasion, or that their concerns had reduced between the two occasions of testing.

Finally, it is interesting to note that there have been no published test re-test reliability checks for the adult version of the measure (Fairburn & Z. Cooper, 1993), or for the CH-EDE.

Divergent validity of the CH-EDE

The sub-scales of the CH-EDE were correlated with three sub-scales of the SDQ to check that the measure was able to assess specific concerns and behaviours associated

with weight, shape and dietary restraint, in overweight children, which would not normally be associated with behavioural problems assessed by the SDQ. As there is some evidence that overweight children may have some emotional problems (e.g. Banis et al., 1988; Strauss et al., 1985) and difficulties with peer relations (e.g. Maddox, et al., 1968), the two SDQ sub-scales which assessed these difficulties were not used to assess the divergent validity of the CH-EDE with this sample.

The Prosocial sub-scale of the SDQ did not correlate with any of the CH-EDE sub-scales, suggesting that there was no association between pro-social behaviour and concerns about weight, shape eating and dietary restraint. There were also no significant correlations between the Restraint sub-scale of the CH-EDE and either the Hyperactivity or the Conduct Problems sub-scales of the SDQ.

There were positive correlations between the Hyperactivity sub-scale of the SDQ and each of the other sub-scales of the CH-EDE and between the Conduct Problems sub-scale of the SDQ and the Weight, Shape and Global Concerns sub-scales of the CH-EDE. This suggests that there was some association between these two measures which is difficult to interpret. One possible explanation is that mothers' perception of their children's behaviour is coloured by their weight, or their own or their daughters' concern about their weight or shape. This explanation would be consistent with the suggestion that overweight children may be perceived negatively by their parents (Kinston, Loader, Miller & Rein, 1988).

A second possibility is that the girls' behaviour is in some way influenced by their weight or shape, or by their perception of themselves. A third possibility is that there is some other influence on both the girls' concerns about weight and shape and on their behaviour. However, none of these possible explanations would account for why there were significant correlations with some sub-scales but not with others.

Concurrent validity of the CH-EDE

The items from the EHQ which were used to check concurrent validity generally correlated well with the CH-EDE sub-scales. However, the EHQ was not an ideal measure for this purpose, being only indirectly concerned with the girls' concerns and dietary restraint, and taken from the mothers' perspective, rather than directly assessing the girls. A second measure of eating pathology for the girls would have overcome this problem. However, it was felt that this would have over-extended the interview period and placed undue demands on the children participating in the study.

Overall, reliability and validity checks carried out for this study raise a number of issues about the use of the CH-EDE interview schedule for research purposes with community samples of children. The reliability and validity of the measure clearly needs some further investigation. Whilst at present it would appear to be the most appropriate measure available, there is scope for further development and refinement of the measure as a research tool for use with children.

In spite of the shortcomings of the CH-EDE discussed in this section, some of which only became apparent during the study, it is probably the best available measure of its

kind, particularly given that there are no known alternative measures which specifically address attitudes and concerns about weight, shape and eating and dietary restraint in a child population.

An added advantage of using the CH-EDE in this study was that it allowed for direct comparison to be made between the girls and their mothers by using the questionnaire version of the adult measure for the mothers.

4.3 Interpretation of the results

4.31 Girls' weight-for-height ratios and pubertal status

Although the overweight girls had more concerns about weight and shape and attempted more dietary restraint than the average weight girls, it is not clear from this study whether being overweight increases concern and dietary restraint or vice versa.

The fact that there was a significant difference in pubertal status between the two groups, as indicated by the number of girls in the index group who had reached menarche, raises the question as to whether the index group may have had higher weight-for-height ratios because their physical development was more advanced than the control group. Alternatively, they may have been more physically mature because of their increased weight. In either case their comparative maturity may have influenced their attitudes towards their weight and shape and their self-perception.

As has been well established, girls become more conscious of their weight and shape with age (e.g. P. Cooper & Goodyer, 1997). It has also been noted that symptoms of

depression increase during adolescence (P. Cooper & Goodyer, 1993). Thus it is possible that the differences in this study were due to maturational differences, rather than weight-for-height ratio differences per se.

4.32 Mothers' BMI

The finding that mothers in the index group had higher BMIs than the control group mothers, is consistent with research into the familial nature of obesity. Garn, Sullivan & Hawthorne (1989) found that the familial relationship between obesity in parents and children is strongest in early adolescence. These authors argue that their data can be explained as an effect of the length of co-habitation, since the relationship diminishes with age, when the children move away from the parental home.

However, the higher BMI of index group mothers, makes interpretation of their higher levels of concern about weight and shape, and their increased dietary restraint difficult. It is possible that their increased concern was simply a reflection of higher weight. A second explanation is that their higher weight was a reflection of their heightened concerns and repeated attempts at dietary restraint, which would be consistent with the literature on the effects of dietary restraint (e.g. Polivy & Herman, 1985; Wilson, 1994).

The fact that there was no association between mothers' BMIs and attempts at dietary restraint in the control group, but a significant negative correlation between BMI and restraint in the index group is particularly interesting. This suggests that although BMI

and dietary restraint were independent of each other in the control group, dietary restraint may have been used in an attempt to control weight by the index group mothers.

The finding that there were significant positive correlations between BMI and concerns and negative beliefs about weight and shape and eating in the control group mothers suggests that for these mothers their level of concern about their weight and shape may have been proportional to their actual weight and shape. However, the lack of positive correlations between BMI and weight, shape and eating concerns or negative beliefs in the index group suggests that for this group levels of concern is not simply proportional to weight. The results also suggest that any eating pathology measured by the EAT score was independent of BMI in both groups.

4.33 Links between mothers' and daughters' concerns & dietary restraint

The finding that there was an association between the mothers' and daughters' Weight, Eating and Global Concerns, in the control group, but no correlations between mothers' and daughters' on any of the Concerns or Restraint sub-scales in the index group was interesting.

This finding suggests that mothers and daughters of average weight may hold similar attitudes towards their weight and eating and their overall concern, as indicated by the correlation with Global Concerns sub-scale; but in overweight girls the relationship is less straightforward. Moreover, because there was a correlation between mothers' BMI

and daughters' weight-for-height ratio in the control group, but not in the index group it is possible that the correlations found in the control group are simply a reflection of weight.

The regression analysis, carried out in an attempt to clarify whether the level of the girls' concern was simply a reflection of their weight, showed that mothers' Weight Concern sub-scale of the EDE-Q, which is a measure of mothers' concern about their own weight, contributed most to the girls overall concern, as measured by the Global Concerns sub-scale of the CH-EDE, followed by the girls' weight-for-height ratio. This finding suggests that mothers may be contributing to their daughters' concerns about their weight and shape either by modelling concern or by encouraging their daughters to be concerned.

4.34 Observations

The clinical impression was that some of the girls in the index group who were the least overweight were very self-conscious about weight and shape, whilst some who were markedly overweight denied having any concerns about weight or shape at all.

Conversely, one or two of the girls, who only just met the criteria for inclusion in the index group, and who did not appear to be markedly overweight, seemed to have a healthy attitude towards both their weight and shape and their self-perception. One of the short-comings of the design of the present study is that it obscures individual differences.

4.4 Theoretical context of the study

The finding that the overweight girls were significantly more concerned about their weight and shape and that they had attempted dietary restraint significantly more than their average weight peers lends support to the hypothesis that these girls may be at an increased risk of developing an eating disorder. The overweight girls also had significantly lower self-esteem and more symptoms of depression. Each of these factors have been identified as risk factors for the later development of eating disorders. Concerns about weight and shape, dietary restraint and self-esteem all have a key role in cognitive formulations of eating disorders (e.g. Fairburn & P. Cooper, 1989). Their presence in overweight children may explain how eating disorders might develop from childhood obesity.

As M. Cooper (1997) explains, assumptions and attitudes about weight and shape represent the core psychopathology of eating disorders and give rise to automatic thoughts and behaviours typically associated with eating disorders. The CH-EDE attempts to measure some of these attitudes and dieting behaviour. Within a cognitive framework the consequences of these concerns seems clear, but how these attitudes and concerns develop is less clear.

In this study it was demonstrated that not only do overweight girls have concerns about their weight and shape, but that these were shared by their mothers. This is consistent with the literature reviewed in the introduction which suggests that mothers may transmit some of their own concerns about weight and shape to their children.

However, clearly this study was not able to demonstrate a causal link. The relationship which was demonstrated between mothers' and daughters' concerns in the control group were not apparent in the index group, although mother and daughters in the index group both had more concerns than their average weight peers. This suggests that the links between mothers and daughters weight and shape concerns and attempts at dietary restraint are not straightforward.

In spite of this, the suggestion that mothers may influence their daughters' attitudes about weight and shape is particularly important in regard to the development of core beliefs during childhood. Core beliefs, or schemata, which guide information processing and behaviour, develop as part of normal cognitive development. When early experiences are negative, maladaptive schemata may develop and these play a powerful role in maintaining psychopathology because they determine what we notice, attend to and remember (Padesky, 1994). However, it is not clear from this study whether attitudes about weight and shape and attempts at dietary restraint are modelled by mothers, or whether mothers influenced their daughters by direct communication, for example by encouraging them to attempt dietary restraint, or perhaps through both of these.

One perspective that may help to draw together the multi-factorial aspects of this study is a schema-focused perspective. This perspective brings together themes from psychodynamic and systemic theory which emphasise the importance of early experience within the family (e.g. Bruch, 1974) in shaping attitudes and beliefs,

particularly core beliefs in relation to food and nurturing, with cognitive-behavioural theories of eating disorders.

A schema-focused perspective is also useful in providing a coherent model of how the development of core beliefs can influence later attitudes about the importance of weight and shape in self-evaluation. These attitudes can lead to dysfunctional thoughts and behaviours around eating. Specifically, the low self-worth associated with eating disorders, the evaluation of self in terms of weight and shape and the emphasis placed on weight, shape, and eating, can be related to self-schemata, weight-related self-schemata and weight-related schemata respectively (Vitousek & Hollon, 1990).

4.5 Clinical implications

This study raises a number of issues which have clinical implications a) for overweight children who are concerned about their weight and shape b) for vulnerability to the development of eating disorders, and c) for children who require treatment for obesity.

4.51 Overweight children who are concerned about their weight and shape

The fact that the level of concern about weight and shape and attempts at dietary restraint were not correlated with weight-for-height in the index group suggests that some of the children in this group may have been considerably more concerned than was warranted by their weight.

The significant correlations between levels of concern on the sub-scales of the CH-EDE and the self-perception sub-scales for Athletic Competence and Physical Appearance and small, but significant correlation between Eating Concern and symptoms of depression on the SMFQ are of concern. These correlations suggests that for overweight girls their weight and shape, or their concern about their weight and shape, may be causing some distress. This in itself is a worrying finding, but in addition to this, the presence of concerns about weight and shape suggests that they may be at risk of developing an eating disorder later in life.

4.52 Overweight as a risk factor in the development of eating disorders

One of the clinical implications of this study is the importance of considering overweight in childhood as a vulnerability factor when assessing clients with eating disorders, in making formulations and in planning treatment. Clients who have had a negative experience of being overweight during childhood may have developed strong attitudes and beliefs about the importance of being thin. Where these attitudes and beliefs are also held by their mothers they may be particularly resistant to change.

In spite of concerns raised by this study that girls who are overweight may be at an increased risk of developing eating disorders, Garfinkel & Garner (1982) point out that many people have weight concerns, and many people habitually attempt dietary restraint, without going on to develop an eating disorder.

Nevertheless, overweight girls do seem to be at greater risk than average weight girls. Overweight girls may therefore need special attention particularly given the clinical impression that eating disordered clients, with a history of obesity, tend to have a poor prognosis. Identifying which girls are most at risk, before their eating habits become pathological, may go some way to reducing the prevalence of eating disorders. Psycho-educational initiatives in schools may help to raise awareness of the issues and potential problems associated with overvalued attitudes to weight and shape and the risks associated with dieting.

4.53 Treatment of obesity

There are a growing number of children who are seriously overweight (Prescott-Clarke & Primatesta, 1998). This is of concern because it seems to present a difficulty in balancing the promotion of healthy attitudes towards weight, shape and dietary restraint without further reinforcing the slim ideal (Hill, et al., 1992).

From a clinical perspective, focusing on a child's weight or shape can lead to a lifetime of attempted dietary restraint and subsequent binge eating (e.g. Fairburn, 1995).

Treatment for obesity therefore needs to be handled sensitively, in order to avoid sensitising the child and promoting a dieting mentality.

If treatment for obesity is to be undertaken, maternal mental health may need to be taken into consideration (Favaro & Santonastaso, 1995). Although the mothers of overweight girls in this study had only slightly higher scores on the GHQ-12 than the

mothers of the average weight girls, from a systemic perspective it may be difficult for a child to overcome a weight problem if there are difficulties or tensions within the family (e.g. Kinston et al. 1988). Clinical experience also suggests that maternal mental health and enmeshed mother-child relationships can have implications for treatment.

4.6 Future research

As can be seen from the literature review, research into the psychological sequelae of overweight and obesity in children is sparse. This study goes only a small way towards redressing this balance and there is still much to be done.

Although some overweight girls in this study were clearly concerned about their weight and shape, others expressed no concern or distress. Further research into what protects some children from becoming concerned about their weight or shape, or developing additional risk factors, is needed. Moreover, whether overweight precedes concern and attempts at dietary restraint or whether concern and dietary restraint precipitate overweight needs to be established.

Further exploration to establish how maternal, or parental attitudes and concerns are transmitted is also needed. This study does not address whether maternal concerns are modelled by mothers or whether mothers directly communicate their concerns about either their own weight and shape or that of their daughters. As Thelen & Cormier (1995) point out this has yet to be clarified in the literature.

Since overweight and obesity in children is increasing in prevalence, it is also important that the factors which motivate children to eat and exercise healthily are investigated. It seems likely that the inter-generational transmission of attitudes towards weight and shape also extend to attitudes about healthy diet and exercise choices. The finding from this study that overweight girls were more likely to have overweight mothers than average weight girls, suggests that there may be familial differences in eating and exercise habits which need further investigation.

A longitudinal study, ideally following overweight children, and their families, from childhood through adolescence and into adulthood, would provide useful insights into whether girls who are overweight are particularly at risk of developing eating disorders. Additional factors that may be protective or increase risk could also be investigated.

Finally, it would be interesting to replicate this study with boys and extend the investigation to include fathers as well as mothers.

There is evidence that a growing number of boys are developing eating disorders (Margo, 1987), but it is not clear whether the issues and concerns are the same for boys and girls (Rozin & Fallon, 1988; Wardle & Marsland, 1990), or whether mothers or fathers influence their sons' attitudes or concerns about weight and shape and dietary restraint (Thelen & Cormier, 1995).

As Margo (1987) points out, being overweight is a risk of developing an eating disorder in boys as well as girls, which is of particular concern given the growing prevalence of obesity in both sexes (Prescott-Clarke & Primatesta, 1998).

4.7 Conclusions

In conclusion, this study supports the hypotheses that girls who are overweight have increased concerns about their weight and shape and attempt dietary restraint more than average-weight girls. There were also indications of lower self esteem and more symptoms of depression in the overweight girls' group. These factors have all been associated with the development of eating disorders. Overweight girls may, therefore, be particularly at risk of developing an eating disorder later in life.

This study also found that mothers of overweight girls have more concerns about weight and shape and attempt dietary restraint more than mothers of average weight girls. The findings suggest that mothers may influence their daughters' attitudes and concerns about weight and shape and attempts at dietary restraint; although, since a direct association between mothers' and daughters' concerns was only found in the control group, the links are clearly not straightforward.

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